UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/972,223	10/05/2001	Mitchell Rosen	1819/100211	4639

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EXAMINER
WU, JINGGE

ART UNIT	PAPER NUMBER
2623	15

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _14 October 2003_.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☐ Claim(s) _1-35,37-39,41 and 42_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _33-35,37-39 and 41_ is/are allowed.

6) ☒ Claim(s) _1-6,14,18,21-26,32 and 42_ is/are rejected.

7) ☐ Claim(s) _7-13,15-17,19-20 and 27-31_ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All b) ☐ Some * c) ☐ None of:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____.
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
    a) ☐ The translation of the foreign language provisional application has been received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____ .

Request for Continued Examination

1.   A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under Ex Parte Quayle, 1935 Comm'r Dec. 11 (1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on May 3, 2001 has been entered.

Remarks

2.   Applicant's arguments with respect to claims 1 and 22 have been fully considered, but they are not persuasive.

        a. Applicant argues that Berns does not teach that "satisfy a first error criterion", which the Examiner has cited a least square matrix as the first criterion. Applicant further argues that computing the least-square matrix M in Berns does not determine which of the seven filters out of a plurality filters will satisfied a first error criterion. Finally, Applicant argues that what Berns has done is different from what the specification disclosed in page 7, lines 19-25.

        However, in response to applicant's argument, Examiner would like to point out that claim language is given its broadest reasonable interpretation. The specification is not measure of invention. Therefore, limitations contained therein can not be read into the claims for the purpose of avoiding the prior art. Ir re Sporck, 55CCPA 743, 386 F. 2d 924, 155 USPQ 687 (1968). In the instant case, first, Berns clearly show that a least

square matrix M is used for computing (transforming) the estimated spectral

reconstruction (see paper #11). The utilization of the least-square matrix is to make sure

the estimation is within the least square error tolerance. Otherwise, Berns needs not to

use M to compute the estimation. In addition, it is well known that least square is a

error criterion because the definition of least square is minimum the square the

difference of errors. Second, the claim language only calls for "satisfy error criterion".

Berns teaches that the spectral reconstruction is conducted by satisfy least square

criterion (see page 17 formula 3). Finally, other limitations cited in the specification by

the Applicant can not be read into the broad claim language for the purpose of avoiding

Berns. If applicant intends to claim the limitations, he should amend the claims

appropriately.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as
> set forth in section 102 of this title, if the differences between the subject matter sought to be
> patented and the prior art are such that the subject matter as a whole would have been obvious
> at the time the invention was made to a person having ordinary skill in the art to which said
> subject matter pertains. Patentability shall not be negatived by the manner in which the invention
> was made.

4.   Claims 1-6, 14, 18, 22-2*, and 42 are rejected under 35 U.S.C. 103(a) as being

unpatentable over the article "Multi-spectral color reproduction research at the Munsell

Color Science Laboratory" to Berns et al. (a reference of record) in view of the article

"Spectrophotometric image analysis of fine art paintings" to Maitre et al.

As to claim 1, Berns discloses a method for spectral imaging, comprising:

capturing high spectral resolution data of at least a first portion of a first scene

using a first plurality of channels (page 16, section 3, note that the first plurality of

channels could be 61 channels);

determining a first set of channels (minimum number of channels) from a second

plurality of channels which can reconstruct spectral of the first portion of first scene

(page 16, section 3, page 18) to satisfy a first error criterion when compared with the

captured high spectral resolution data (Fig. 1, page 15-17, section 3, note that the error

criterion is the least-square, see page 17, formula 3); and

capturing pixel data of at least a second portion of at least first scene using the

first set of channels (page 16-18, section 3, note that capturing or reconstructing at least

a portion of pixel data is inherent when the portion of the image is reconstructed).

Even if , for the sake of argument, Berns does not explicitly mention the error

criterion is used for choosing channels (filters, note that Berns mentions choosing

minimum channels) .

Maitre, in an analogous environment, discloses using a error criterion(equation

10 or 11) to choose optimal channels (filters) (page 52-53).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to use the scheme of Maitre in the method of Berns in order to use

minimal necessary channels (filters) to reconstruct the spectral image (Matre, page 50

and abstract).

As to claim 2, the combination of Berns and Maitre further discloses the first set of channels comprises a smallest number of the plurality of channels (minimum channels) which can be used to reconstruct spectral of the first portion of the first scene to satisfy a first error criterion when compared with the captured high spectral resolution data (page 16, section 3, note that the error criterion is the least-square, Maitre, abstract).

As to claim 3, Berns further discloses the data of the channels are stored (Fig. 1), other limitations are discussed with regard to claim 1.

As to claims 4-6, Berns further discloses determining a first transform from the first set of channels and using the transform to reconstruct image specta(Fig. 1, page 16, section 3, note that equations 1 and 2 are transforms, the storing the transform is inherent), other limitations are addressed with regard to claim 1.

As to claims 14, Berns further discloses storing the captured pixel data (Fig. 1).

As to claim 18, Berns further discloses the first error criterion requires that the reconstructed spectra of the first portion of the first scene be within a first error tolerance or the reconstructed spectra be associated with a minimum value for predetermined metric when compared with the captured high spectral resolution data (Fig. 3, page 16-17, section 3, note that the error criterion is the least-square).

As to claims 22-26, the claims are corresponding system claims to claims 1-6. The discussions are addressed with regard to claims 1-6.

As to claim 42, Berns further discloses the imaging system comprising:

a first imaging system that captures the high spectral resolution data (page 18-

19) of at least portion of the first scene using the plurality of channels (Fig. 1, page 15-

17); and

a second imaging system captures the pixel data of the scene using the first set

of channels (Fig. 1, page 15-17).

1. Claims 21, 32, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Berns in view of US 5949914 to Yuen.

As to claims 21, 32, and 41, Berns dose not explicitly mention the number of first

and second channels or subsystems are identical.

Yuen, in an analogous environment, discloses using multiple identical channels

or sub-imaging systems (Fig. 9a).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to use the scheme of Yuen in the method of Berns in order to

increase the resolution of the multi-spectral image data (Yuen, col. 2 lines 3-12).

Allowable Subject Matter

2. Claims 7-13 , 15-17, 19-20, 27-31, are objected to as being dependent upon a

rejected base claim, but would be allowable if rewritten in independent form

including all of the limitations of the base claim and any intervening claims.

Claims 7, 20, 27 are objected. Claims 8-13, 15-17 and 19 depend from claim 7,

therefore, are objected. Claims 28-31 depend from claim 27, therefore, are objected.

Claims 33 and 37 are allowed. Claims 34-35 and claims 38-39 and 41 depend

from claims 33 and 37 respectively are, therefore, allowed.

Contact Information

Any inquiry concerning this communication or earlier communications should be

directed to Jingge Wu whose telephone number is (703) 308-9588. He can normally be

reached Monday through Thursday from 8:00 am to 5:30 pm. The examiner can be

also reached on second alternate Fridays.

Any inquiry of a general nature or relating to the status of this application should

be directed to TC customer service whose telephone number is (703) 306-0377.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's

supervisor, Amelia Au, can be reached at (703) 308-6604.

The Working Group Fax number is (703) 872-9314.

Jingge Wu

Primary Patent Examiner